

## Novel Delivery Systems For Oral Vaccines

This invaluable reference presents a comprehensive review of the basic methods for characterizing bioadhesive materials and improving vehicle targeting and uptake-offering possibilities for reformulating existing compounds to create new pharmaceuticals at lower development costs. Evaluates the unique carrier characteristics of bioadhesive polymers and their power to enhance localization of delivered agents, local bioavailability, and drug absorption and transport! Written by over 50 international experts and reflecting broad knowledge of both traditional bioadhesive strategies and novel clinical applications, Bioadhesive Drug Delivery Systems discusses mechanical and chemical bonding, polymer-mucus interactions, the effect of surface energy in bioadhesion, polymer hydration, and mucus rheology analyzes biochemical properties of mucus and glycoproteins, cell adhesion molecules, and cellular interaction with two- and three-dimensional surfaces covers microbalances and magnetic force transducers, atomic force microscopy, direct measurements of molecular level adhesions, and methods to measure cell-cell interactions examines bioadhesive carriers, diffusion or penetration enhancers, and lectin-targeted vehicles describes vaginal, nasal, buccal, ocular, and transdermal drug delivery reviews bioadhesive interactions with the mucosal tissues of the eye and mouth, and those in the respiratory, urinary, and gastrointestinal tracts explores issues of product development, clinical testing, and production and more! Amply referenced with over 1400 bibliographic citations, and illustrated with more than 300 drawings, photographs, tables, and display equations, Bioadhesive Drug Delivery Systems serves as a sound basis for innovation in bioadhesive systems and an excellent introduction to the subject. This unique reference is ideal for pharmaceutical scientists and technologists; chemical, polymer, and plastics engineers; biochemists; physical, surface, and colloid chemists; biologists; and upper-level undergraduate and graduate students in these disciplines.

**Drug Targeting and Stimuli Sensitive Drug Delivery Systems** covers recent advances in the area of stimuli sensitive drug delivery systems, providing an up-to-date overview of the physical, chemical, biological and multistimuli-responsive nanosystems. In addition, the book presents an analysis of clinical status for different types of nanoplatfoms. Written by an internationally diverse group of researchers, it is an important reference resource for both biomaterials scientists and those working in the pharmaceutical industry who are looking to help create more effective drug delivery systems. Shows how the use of nanomaterials can help target a drug to specific tissues and cells Explores the development of stimuli-responsive drug delivery systems Includes case studies to showcase how stimuli responsive nanosystems are used in a variety of therapies, including camptothecin delivery, diabetes and cancer therapy

This contribution book collects reviews and original articles from eminent experts working in the interdisciplinary arena of novel drug delivery systems and their uses. From their direct and recent experience, the readers can achieve a wide vision on the new and ongoing potentialities of different drug delivery systems. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in the design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, pulmonary, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

This book highlights recent innovative work in nutraceutical delivery systems, focusing on strategies and approaches for delivering maximum health benefits from foods. It presents recent research-oriented work from diverse global perspectives on isolation techniques for nutraceutical components, phytosomes, liposomes, solid dispersions, micelles, self-emulsifying drug delivery systems, microemulsions, solid lipid nanoparticles, polyelectrolyte complexes, oral delivery, polymeric nanoparticles, and more. The book begins with an overview of recent facts and diverse perspectives on the use of nutraceuticals in medicine and proceeds to discuss recent techniques in isolation of nutraceuticals from plants and in solubility enhancement. It looks at innovations and advances in nanoparticles-based nutraceutical delivery, such as in solid lipid nanoparticles (SLNs), fabrication methods of therapeutic nanoparticles, and polymeric nanoparticles-based nutraceutical delivery system. It also discusses vesicular delivery systems and biphasic systems for nutraceutical applications. The book also looks at the challenges in oral delivery and the latest taste-masking techniques.

Validation from Biodistribution to Sites of Action

Oral Modified Release Drug Delivery System

Advanced Drug Delivery Systems in the Management of Cancer

Novel Drug Delivery Systems

Controlled Release in Oral Drug Delivery

**Long-Acting Drug Delivery Systems: Pharmaceutical, Clinical, and Regulatory Aspects** offers a comprehensive overview of the technical, clinical, regulatory and industrial perspectives on these drug delivery systems. The book follows a sequential order, beginning with the current technical state-of-the-field and moving on to more clinical, industrial and regulatory topics. Opening chapters describe the current needs and potential applications of implantable and long-acting therapeutic approaches. The book goes on to describe established and novel long-acting systems, with a focus on the materials used to prepare these systems and their biocompatibility. Importantly, applied topics such as scale-up manufacturing, products under clinical trials and regulatory aspects are covered, offering the reader a holistic view of this rapidly growing field. Brings together technical, clinical, regulatory and industrial perspectives for a complete overview of long acting and implantable drug delivery systems Provides up-to-date coverage of established and novel long-acting and implantable drug delivery systems, both in development and actively in use Appeals to a broad readership, including materials scientists, pharmaceutical scientists, biomedical engineers, clinicians and regulatory experts

Provides both fundamentals and new and emerging applications **Advanced Drug Delivery** brings readers fully up to date with the state of the science, presenting the basics, formulation strategies, and therapeutic applications of advanced drug delivery. The book demonstrates how core concepts of pharmaceutical sciences, chemistry, and molecular biology can be combined and applied in order to spark novel ideas to design and develop advanced drug delivery systems for the treatment of a broad range of human diseases. **Advanced Drug Delivery** features contributions from an international team of pharmaceutical scientists. Chapters reflect a thorough review and analysis of the literature as well as the authors' firsthand experience developing drug delivery systems. The book is divided into four parts: Part I, Introduction and Basics of Advanced Drug Delivery, explores physiological barriers, stability, transporters, and biomaterials in drug delivery Part II, Strategies for Advanced Drug Delivery, offers tested and proven strategies for advanced delivery of both small molecules and macromolecules Part III, Translational Research of Advanced Drug Delivery, focuses on regulatory considerations and translational applications of advanced drug delivery systems for the treatment of cardiovascular diseases, cancer, sexually transmitted diseases, ophthalmic diseases, and brain diseases Part IV, Future Applications of Advanced Drug Delivery in Emerging Research Areas, examines stem cell research, cell-based therapeutics, tissue engineering, and molecular imaging Each chapter provides objectives and assessment questions to help readers grasp key concepts and assess their knowledge as they progress through the book. **Advanced Drug Delivery** is recommended for graduates and upper-level undergraduates in the pharmaceutical sciences who need a solid foundation in the basics. It is also recommended for pharmaceutical professionals who want to take advantage of new and emerging applications in advanced drug delivery systems.

Oral drug delivery has been an important part of drug delivery and was often linked with tablets, capsules, syrups etc during the discussion about delivery through gastrointestinal tract. Advancements in pharmaceutical sciences and enormous research in the field of drug delivery has laid newer concepts leading to the advent of advanced dosage forms with modified release leading to enhanced therapeutic efficacy. Similarly oral drug delivery has witnessed a change. The book as it is in present form is compilation of theories postulated with regards to oral drug delivery and data related to research work. Different facets of oral drug delivery from conventional to novel have been described through self explicit figures and relevant examples. Underlying basic concepts of different processes have been explained for better understanding of the subject. This book will serve as ready reference for undergraduate and postgraduate students and will cater to the scientific need of those interested in research in oral drug delivery.

**Encapsulation of Active Molecules and Their Delivery System** covers the key methods of preparation of encapsulation, as well as release mechanisms and their applications in food, biotechnology, metal protection, drug delivery, and micronutrients delivery in agriculture. The book also provides real-life examples of applications in food and other industries. Sections encompass (i) Synthesis and characterization methods of micro- and nanocarriers as the delivery systems, (ii) Up-to-date encapsulation techniques in the areas of pharmaceuticals, nutraceuticals and corrosion, (iii) The release methods of the encapsulated materials, and (iv) Industry perspectives, including scale up of the processes. Focuses on encapsulation processes in chemical and materials engineering and biotechnology Provides a relevant resource for the pharmaceutical and food industries Presents wide coverage on the entrapment of molecules that scales-up to industrial sized needs

Fundamentals, Novel Approaches, and Development

Chemical Aspects of Drug Delivery Systems

Promising Strategies for Overcoming Delivery Challenges

Gibaldi's Drug Delivery Systems in Pharmaceutical Care

Science and Technology

**Oral Colon-Specific Drug Delivery** covers approaches used to deliver a variety of drugs to the colon. Anatomy and physiology of the gastrointestinal tract as it affects colonic drug delivery and pharmacokinetics are reviewed, as well as drug absorption from the colon. The book presents valuable information on a variety of topics, including oral peptide/protein delivery, dextran-based delivery systems, glycoside/glycosidase-based delivery, azo-bond prodrugs, hydroxypropyl methacrylamide copolymers for colonic delivery, and matrices for colonic drug delivery. Special emphasis is placed on delivery systems, especially biochemical approaches to delivery, such as the use of degradable polymers and both low and high molecular weight prodrugs. **Oral Colon-Specific Drug Delivery** will provide a valuable reference resource for gastroenterologists, pharmaceutical scientists, and other researchers working with drug delivery to the colon.

A comprehensive treatment of the science, technology, and regulation of rate-controlled administration of therapeutic agents, with coverage of the basic concepts, fundamental principles, biomedical rationales, and potential applications. This revised and updated edition (first in 1982) incorporates Nanotechnology for Oral Drug Delivery: From Concept to Applications discusses the current challenges of oral drug delivery, broadly revising the different physicochemical barriers faced by nanotechnology-based oral drug delivery systems, and highlighting the challenges of improving intestinal permeability and drug absorption. Oral delivery is the most widely used form of drug administration due to ease of ingestion, cost effectiveness, and versatility, by allowing for the accommodation of different types of drugs, having the highest patient compliance. In this book, a comprehensive overview of the most promising and up-to-date engineered and surface functionalized drug carrier systems, as well as opportunities for the development of novel and robust delivery platforms for oral drug administration are discussed. The relevance of controlling the physicochemical properties of the developed particle formulations, from size and shape to drug release profile are broadly reviewed. Advances in both in vitro and in vivo scenarios are discussed, focusing on the possibilities to study the biological-material interface. The industrial perspective on the production of nanotechnology-based oral drug delivery systems is also covered. **Nanotechnology for Oral Drug Delivery: From Concept to Applications** is essential reading for researchers, professors, advanced students and industry professionals working in the development, manufacturing and/or commercialization of nanotechnology-based systems for oral drug delivery, targeted drug delivery, controlled drug release, materials science and biomaterials, in vitro and in vivo testing of potential oral drug delivery technologies. Highlights the relevance of oral drug delivery in the clinical setting Covers the most recent advances in the field of nanotechnology for oral drug delivery Provides the scientific community with data that can facilitate and guide their research

Polymers have played a critical role in the rational design and application of drug delivery systems that increase the efficacy and reduce the toxicity of new and conventional therapeutics. Beginning with an introduction to the fundamentals of drug delivery, **Engineering Polymer Systems for Improved Drug Delivery** explores traditional drug delivery techniques as well as emerging advanced drug delivery techniques. By reviewing many types of polymeric drug delivery systems, and including key points, worked examples and homework problems, this book will serve as a guide to for specialists and non-specialists as well as a graduate level text for drug delivery courses.

Introduction of Novel Drug Delivery Systems

Oral Mucosal Drug Delivery and Therapy

Recent Advances in Novel Drug Carrier Systems

Pharmaceutical, Clinical, and Regulatory Aspects

Encapsulation of Active Molecules and Their Delivery System

**A Textbook of Novel Drug Delivery Systems"** consists of 10 chapters and covers basic concepts in mucoadhesive drug delivery system, oral controlled drug delivery system, prodrugs, resealed erythrocytes and transdermal drug delivery systems. This book has been written with clear description, figure along with illustrative examples.

**Advanced Drug Delivery Systems in the Management of Cancer** discusses recent developments in nanomedicine and nano-based drug delivery systems used in the treatment of cancers affecting the blood, lungs, brain, and kidneys. The research presented in this book includes international collaborations in the area of novel drug delivery for the treatment of cancer. Cancer therapy remains one of the greatest challenges in modern medicine, as successful treatment requires the elimination of malignant cells that are closely related to normal cells within the body. Advanced drug delivery systems are carriers for a wide range of pharmacotherapies used in many applications, including cancer treatment. The use of such carrier systems in cancer treatment is growing rapidly as they help overcome the limitations associated with conventional drug delivery systems. Some of the conventional limitations that these advanced drug delivery systems help overcome include nonspecific targeting, systemic toxicity, poor oral bioavailability, reduced efficacy, and low therapeutic index. This book begins with a brief introduction to cancer biology. This is followed by an overview of the current landscape in pharmacotherapy for the cancer management. The need for advanced drug delivery systems in oncology and cancer treatment is established, and the systems that can be used for several specific cancers are discussed. Several chapters of the book are devoted to discussing the latest technologies and advances in nanotechnology. These include practical solutions on how to design a more effective nanocarrier for the drugs used in cancer therapeutics. Each chapter is written with the goal of informing readers about the latest advancements in drug delivery system technologies while reinforcing understanding through various detailed tables, figures, and illustrations. **Advanced Drug Delivery Systems in the Management of Cancer** is a valuable resource for anyone working in the fields of cancer biology and drug delivery, whether in academia, research, or industry. The book will be especially useful for researchers in drug formulation and drug delivery as well as for biological and translational researchers working in the field of cancer. Presents an overview of the recent perspectives and challenges within the management and diagnosis of cancer Provides insights into how advanced drug delivery systems can effectively be used in the management of a wide range of cancers Includes up-to-date information on diagnostic methods and treatment strategies using controlled drug delivery systems

It is important to make therapeutics a critical component of teaching about dosage forms and to make dosage forms and drug delivery systems an integral part of therapeutics. This book will be the first to focus on the therapeutic impact of drug dosage forms. Tying together concepts of traditional pharmaceuticals with therapeutics, **Drug Delivery Systems in Pharmaceutical Care** demonstrates how the modern clinical pharmacist can integrate knowledge in pharmaceutical sciences and therapeutics with appreciation of patient needs and nuances to advise on preferable and optimal product choices. Each chapter represents a collaboration of a clinical pharmacist practitioner and a pharmaceutical scientist. This unique perspective takes the science of dosage form design and helps translate the theory into the pragmatic. **Special Features:** Case studies and problems to help students get a better understanding of concepts Well-organized chapters with outlines and objectives Summary tables and helpful figures, along with reasonable compilations of original references Final sections with 'Learning Points' that reinforce essential material. Foreword by William J. Jusko, PhD, Professor and Chair, University of Buffalo, Department of Pharmaceutical Sciences

The book provides a single volume covering detailed descriptions about various delivery systems, their principles and how these are put in use for the treatment of multiple diseases. It is divided into four sections where the first section deals with the introduction and importance of novel drug delivery system. The second section deals with the most advanced drug delivery systems like microbubbles, dendrimers, lipid-based nanoparticles, nanofibers, microemulsions etc., describing the major principles and techniques of the preparations of the drug delivery systems. The third section elaborates on the treatments of diverse diseases like cancer, topical diseases, tuberculosis etc. The fourth and final section provides a brief informative description about the regulatory aspects of novel drug delivery system that is followed in various countries.

**Oral Colon-Specific Drug Delivery**

**Bioadhesive Drug Delivery Systems**

**Engineering Polymer Systems for Improved Drug Delivery**

**Physicochemical and Biopharmaceutical Investigations of Novel Drug Delivery Systems for Oral Administration of Poorly Water-soluble Drugs**

**A Comprehensive Text Book on Self-emulsifying Drug Delivery Systems**

*Controlled Release in Oral Drug Delivery provides focus on specific topics, complementing other books in the initial CRS series. Each chapter sets the context for the inventions described and describe the latitude that the inventions allow. In order to provide some similar look to each chapter, the coverage includes the historical overview, candidate drugs, factors influencing design and development, formulation and manufacturing and delivery system design. This volume was written along three main sections: the relevant anatomy and physiology, a discussion on candidates for oral drug delivery and the major three groups of controlled release systems: diffusion control (swelling and inert matrices); environmental control (pH sensitive coatings, time control, enzymatic control, pressure control) and finally lipidic systems.*

*Modeling and Control of Drug Delivery Systems provides comprehensive coverage of various drug delivery and targeting systems and their state-of-the-art related works, ranging from theory to real-world deployment and future perspectives. Various drug delivery and targeting systems have been developed to minimize drug degradation and adverse effect and increase drug bioavailability. Site-specific drug delivery may be either an active and/or passive process. Improving delivery techniques that minimize toxicity and increase efficacy offer significant potential benefits to patients and open up new markets for pharmaceutical companies. This book will attract many researchers working in DDS field as it provides an essential source of information for pharmaceutical scientists and pharmacologists working in academia as well as in the industry. In addition, it has useful information for pharmaceutical physicians and scientists in many disciplines involved in developing DDS, such as chemical engineering, biomedical engineering, protein engineering, gene therapy. Presents some of the latest innovations of approaches to DDS from dynamic controlled drug delivery, modeling, system analysis, optimization, control and monitoring Provides a unique, recent and comprehensive reference on DDS with the focus on cutting-edge technologies and the latest research trends in the area Covers the most recent works, in particular, the challenging areas related to modeling and control techniques applied to DDS*

*This volume provides a comprehensive overview of the current issues facing scientists working on delivering drugs locally and systemically via the membranes that line the mouth. The book describes the anatomical and physiological challenges of this route for drug delivery and how they impact the design of oral mucosal drug delivery systems. It also provides a detailed description of current oral mucosal drug delivery technologies that overcome these challenges alongside research, development and assessment methods. In 11 authoritative chapters, the book affords an in-depth evaluation of the major issues associated with this route of administration, namely the retention of the drug/product at the site of administration and increasing drug permeability through the oral mucosa. The book provides insights into the in vitro and in vivo methods available to assess drug permeability and retention, offers solutions on how to improve the permeation of the drugs through the oral mucosa, and explores approaches to prolong drug/product retention at the site of administration. It also indicates future directions in research and product development. Oral Mucosal Drug Delivery and Therapy is a key resource for those wishing to extend their knowledge of this field.*

*This text book is a guide for pharmaceutical academics (students and teachers) as well as industry professionals learning about drug delivery and formulation. Chapters presents comprehensive information about self-emulsifying formulations by providing an in-depth understanding of the basic concepts and formulation mechanisms. This information is supplemented by details about current research and development in this field. Readers will learn about the types of self-emulsifying drug delivery systems, evaluation parameters and digestion models, among other topics. Key Features: - 9 chapters organized in a reader-friendly layout - complete guide on self-emulsifying drug delivery formulations, including lipid based systems, SMEDOS, surfactants, and oral dosage forms - includes basic concepts and current developments in research and industrial applications - presents information on conventional and herbal formulations - references for further reading*

*Novel Drug Delivery Systems for Chinese Medicines*

*Nanotechnology for Oral Drug Delivery*

*Nutraceutical Delivery Systems*

*Novel Delivery Sys for Oral Vaccines*

*Handbook of Non-Invasive Drug Delivery Systems*

In this concise and systematic book, a team of experts select the most important, cutting-edge technologies used in drug delivery systems. They take into account significant drugs, new technologies such as nanoparticles, and therapeutic applications. The chapters present step-by-step laboratory protocols following the highly successful *Methods in Molecular Biology*™ series format, offering readily reproducible results vital for pharmaceutical physicians and scientists.

This book describes the essential and cutting-edge concepts based on the frontier of pharmaceutical research in TCM, underlying scientific principles, and current advancements of drug delivery systems for Chinese medicines, including sustained-release drug delivery systems, trans-nasal drug delivery systems, dermal and transdermal drug delivery systems, etc. Novel carriers and emerging technologies (such as 3D printing) are also covered. The book provides readers with an overall picture of drug delivery systems for Chinese medicines and also yields benefits for the pharmaceutical industry with regard to TCM-based drug development.

With the improvements in formulation science and certain transdermal delivery technologies, the non-invasive mode of drug delivery is now ready to compete with traditional methods of oral and injectible routes of drug delivery. The *Handbook of Non-Invasive Drug Delivery Systems* encompasses the broad field of non-invasive drug delivery systems that include drug delivery via topical, transdermal-passive, transdermal-active (device- aided enhanced penetration), trans-mucosal membrane, trans-ocular membrane as well as delivery via alveolar membrane from inhaled medication. Patient compliance has been found to be much higher when administered by non-invasive routes and therefore they are considered to be a preferred mode of drug delivery. The book includes both science and technological aspects of new drug delivery systems. Its unique focus is that it is on new drug delivery systems that are considered to be "non-invasive". Other unique features include a chapter on Regulatory Aspects of non-invasive systems and one on FDA guidance for topical nano-drug delivery. Two chapters covering market trends and perspectives, as well as providing guidance to those marketing such systems are also included.

This is a useful textbook and resource for undergraduate and postgraduate students and anyone in the working concepts of a drug delivery system and its performance. A novel drug delivery system refers to strategy, technology, formulation-based approaches and customized system(s) developed for safe administration and within body transportation of drugs as needed for optimum therapeutic benefits while ensuring minimum to nil toxic effects. Multidisciplinary approaches and cutting edge technology have been used to develop the carrier modules to deliver the contained drug to the target tissues in a preprogrammed manner. The process desirably modifies the drug distribution and accumulation, thereby producing optimum therapeutic effects. Carrier-mediated drug delivery has emerged as a powerful technology for the treatment of various difficult pathologies. The therapeutic index of conventional and novel drug is enhanced owing to specificity due to targeting of drug to the particular tissue. This book includes an introduction to novel drug delivery, oral osmotic pumps, bioadhesive and mucoadhesive systems, multiple emulsions, colon-specific drug delivery systems, transdermal drug delivery systems, spherical crystallization, microemulsion, implants and inserts, micellar systems, liposomes, microspheres and microcapsules, nanoparticles, resealed erythrocytes, transfersomes and ethosomes, organogels, dendrimers, niosomes, solid lipid nanoparticles, drug conjugates, cyclodextrin complexes, multifunctional nanomedicines, and floating drug delivery system(s). Each chapter attempts to discuss introduction, concept, progress, status and future prospects of the concerned novel drug delivery system.

Advanced Drug Delivery

Excipient Development for Pharmaceutical, Biotechnology, and Drug Delivery Systems

Long-Acting Drug Delivery Systems

Modeling and Control of Drug Delivery Systems

#### Silica-lipid Hybrid Microcapsules

Despite advances in the development of new drugs, a drug may never reach the target organ, or it may be difficult to achieve the necessary level of drug in the body. Large doses can result in serious side effects and can harm normal, as well as diseased, cells and organs, and for this reason it is vital that controlled release and the targeting of delivery systems must evolve in parallel to drug research. Chemical Aspects of Drug Delivery Systems reflects the modern challenge to devise effective drug delivery and targeting systems, giving particular emphasis to recent innovations in the field. Delivery systems described include carbohydrate derivatives, novel nonionic surfactant vesicles and various polymers, including polyacrylates and aqueous shellac solutions, as well as hydrogels. In addition, many of the key issues, such as the understanding of biosystems and targets and the development of materials to provide the deserved carrier and excipient properties for controlled, targeted drug delivery, are considered in depth. This book will be of equal interest to undergraduate, graduate, researcher and those in the pharmaceutical industries, and it complements two previous RSC Special Publications, Encapsulation and Controlled Release and Excipients and Delivery Systems for Pharmaceutical Formulations.

Novel Drug Delivery Systems for Phytoconstituents discusses general principles of drug targeting, construction material and technological concerns of different phytoconstituent in delivery systems. It focuses on the development of novel herbal formulations and summarizes their method of preparation, type of active ingredients, route of administration, biological activity and their applications. It discusses therapeutic activities of plant derived chemicals, their limitations in clinical applications and novel drug delivery solutions to overcome them to provide better therapeutic effects with controlled and targeted drug delivery. Focus on drug delivery of phytomolecules Act as bridge between natural product scientist and clinical doctors Discusses mechanism of poor bioavailability of herbal molecules Increases awareness towards phytochemical efficacy Summarizes efficient novel delivery systems-based formulations. It extensively covers the applications of novel drug delivery systems including polymeric nanoparticles, solid lipid nanoparticles, nanostructured lipid capsules, liposomes, phytosomes, microspheres, transferosomes, and ethosomes. Some chapters are especially focused on anticancer phytochemicals, silymarin, andrographolide, berberine, and curcumin delivery with special emphasis on their application.

The preferred route for drug delivery remains the oral route, but oral drug delivery has now developed beyond traditional dosage forms such as tablets and capsules. Nowadays it is possible to use polymers to allow drugs to be targeted to specific sites in the gastrointestinal tract, and to extend the drug release profile. In addition, polymers can be engineered to allow oral delivery of such complex molecules as proteins, peptides, and even genes. This book gives a comprehensive summary of oral drug delivery systems, both conventional and novel, and the ways in which polymers have been adapted for these systems. Particular attention is devoted to gastrointestinal physiology and the physio-chemical properties of polymers in order to understand the factors affecting their performance in practice. This update will interest everyone involved in the pharmaceutical world, whether in academia or in industry. It will be of particular value to those responsible for designing new oral drug delivery systems involving polymers. It will provide a useful reference text both for researchers and manufacturers, and will also be a helpful introduction for students of all levels to the application of polymers in pharmacy.

To facilitate the development of novel drug delivery systems and biotechnology-oriented drugs, the need for new excipients to be developed and approved continues to increase. Excipient Development for Pharmaceutical, Biotechnology, and Drug Delivery Systems serves as a comprehensive source to improve understanding of excipients and forge new avenues.

#### Novel Drug Delivery Systems for Phytoconstituents

#### Drug Targeting and Stimuli Sensitive Drug Delivery Systems

#### Development of Novel Oral Mucosal Drug Delivery Systems

#### Drug Delivery Systems

#### Novel Drug Delivery Systems and Regulatory Affairs

This one-of-a-kind book represents a timely and detailed assessment of the wide range of alternative "antigen carriers" that are currently being investigated as prospective delivery systems for the development of new and improved oral vaccines. Oral delivery remains the "ideal" approach to vaccination, both for economic reasons and for reasons of patient acceptability. However, the oral route of immunization remains underexploited, clinically, mainly because oral vaccines have traditionally been poorly immunogenic. Nevertheless, recent developments in the formulation of nonliving antigen carrier systems and in the development of live nonpathogenic carrier systems have given rise to real optimism that new oral vaccines will soon be developed. This book looks at these new developments in antigen delivery systems. Each alternative carrier system is assessed, including both its potential advantages and limitations. The book details how these antigen delivery systems might contribute to the development of new and improved oral vaccines for human use.

The application of drug delivery is a valuable, cost-effective lifecycle management resource. By endowing drugs with new and innovative therapeutic benefits, drug delivery systems extend products' profitable lifecycle, giving pharmaceutical companies competitive and financial advantages, and providing patients with improved medications. Formulation development is now being used to create new dosage forms for existing products, which not only reduces the time and expense involved in new drug development, but also helps with regard to patent protection and bypassing existing patents. Today's culture demands convenience, a major factor determining adherence to drug therapy. Over the past few years, patient convenience-oriented research in the field of drug delivery has yielded a range of innovative drug-delivery options. As a result, various drug-delivery systems, including medicated chewing gums, oral dispersible tablets, medicated lozenges and lollipops, have now hit the market and are very popular. These dosage forms offer a highly convenient way to dose medications, not only for special population groups with swallowing difficulties, such as children and the elderly, but for the general populace as well. This book provides valuable insights into a number of formulation design approaches that are currently being used, or could be used, to provide new benefits from existing drug molecules.

Novel Drug Delivery Systems | Transdermal Drug Delivery Systems | Mucoadhesive Drug Delivery Systems | Targeted Drug Delivery Systems | Regulatory Agencies | Quality Assurance | Good Manufacturing Practices | Validation Chitosan in Drug Delivery provides thorough insights into chitosan chemistry, collection, chemical modifications, characterization and applications in the pharmaceutical industry and healthcare fields. The book explores molecular weight, degree of deacetylation and molecular geometry, emphasizing recent advances in the field as written by academic, industry and regulatory scientists. It will be a useful resource for pharmaceutical scientists, including industrial pharmacists, analytical scientists, postgraduate students, health care professionals and regulatory scientists actively involved in pharmaceutical product and process development in natural polymers containing drug delivery. Provides methodologies for the design, development and selection of chitosan in drug delivery for particular therapeutic applications Includes illustrations demonstrating the mechanism of biological interaction of chitosan Discusses the regulatory aspects and demonstrates the clinical efficacy of chitosan

#### Drug Delivery Applications of Noninvasive Imaging

#### Oral Lipid Drug Delivery Systems

#### Oral Modified Drug Delivery Systems

#### Update on Polymers for Oral Drug Delivery

#### Chitosan in Drug Delivery

**Cost-effective strategies for designing novel drug delivery systems that target a broad range of disease conditions** In vivo imaging has become an important tool for the development of new drug delivery systems, shedding new light on the pharmacokinetics, biodistribution, bioavailability, local concentration, and clearance of drug substances for the treatment of human disease, most notably cancer. Written by a team of international experts, this book examines the use of quantitative imaging techniques in designing and evaluating novel drug delivery systems and applications. Drug Delivery Applications of Noninvasive Imaging offers a full arsenal of tested and proven methods, practices and guidance, enabling readers to overcome the many challenges increasing successful new drug delivery systems. The book begins with an introduction to molecular imaging. Next, it covers: In vivo imaging techniques and quantitative analysis Imaging drugs and drug carriers at the site of action, including low-molecular weight radiopharmaceuticals, peptides and proteins, siRNA, cells, and nanoparticles Applications of imaging techniques in administration routes other than intravenous injection, such as pulmonary and oral delivery Translational research leading to clinical applications Imaging drug delivery in large animal models Clinical applications of imaging techniques to guide drug development and drug delivery Chapters are based on a thorough review of the current literature as well as the authors' firsthand experience working with imaging techniques for the development of novel drug delivery systems. Presenting state-of-the-art technology applications of imaging in preclinical and clinical evaluation of drug delivery systems, Drug Delivery Applications of Noninvasive Imaging offers cost-effective strategies to pharmaceutical researchers and students for developing drug delivery systems that accurately target a broad range of disease conditions.

#### Innovative Strategies for Drug Re-positioning

#### Nanopharmaceutical Advanced Delivery Systems

#### A Textbook of Novel Drug Delivery Systems

#### Oral Drug Delivery Systems and Materials

#### Novel Formulation Approaches in the Design Strategy, Development and Evaluation of Oral Controlled Release Drug Delivery Systems